SEQUENCE LISTING

<110> F. Hoffmann-la Roche AG
<120> Use of Acid-Stable Subtilisin Proteases in Animal Feed
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<140> DK 2000 00200
<141> 2000-02-08
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<170> PatentIn version 3.0
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His Arg Gln Pro Gly Ser Thr Ser Tyr Ile Tyr
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His Arg Ser Arg Gly Ser
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Leu Phe Pro Ala Phe Gly Gly Ser Ser Leu Ala Lys Glu Ala Pro Lys
    -10                 -5              -1  1               5

Pro Phe Gln Pro Ile Asn Lys Thr Leu Asp Lys Gly Ala Phe Glu Ser
                10                  15                  20

Gly Glu Val Ile Val Lys Phe Lys Asp Gly Val Ser Lys Lys Ala Gln
            25                  30                  35

Gly Ser Ala Leu Asn Lys Ala Glu Ala Asn Glu Gln Lys Ala Ser Ala
        40                  45                  50

Lys Asp Pro Phe Gln Val Leu Glu Val Ala Asp Val Asp Gln Ala Val
    55                  60                  65

Lys Ala Leu Glu Asn Asn Pro Asn Val Glu Tyr Ala Glu Pro Asn Tyr
70                  75                  80                  85

Thr Phe Gln Ala Thr Trp Ser Pro Asn Asp Pro Tyr Tyr Ser Ala Tyr
                90                  95                  100

Gln Tyr Gly Pro Gln Asn Thr Ser Thr Pro Ala Ala Trp Asp Val Thr
            105                 110                 115

Arg Gly Ser Ser Thr Gln Thr Val Ala Val Leu Asp Ser Gly Val Asp
        120                 125                 130

Tyr Asn His Pro Asp Leu Ala Arg Lys Val Ile Lys Gly Tyr Asp Phe
    135                 140                 145

Ile Asp Arg Asp Asn Asn Pro Met Asp Leu Asn Gly His Gly Thr His
150                 155                 160                 165

Val Ala Gly Thr Val Ala Ala Asp Thr Asn Asn Gly Ile Gly Val Ala
                170                 175                 180

Gly Met Ala Pro Asp Thr Lys Ile Leu Ala Val Arg Val Leu Asp Ala
            185                 190                 195

Asn Gly Ser Gly Ser Leu Asp Ser Ile Ala Ser Gly Ile Arg Tyr Ala
        200                 205                 210

Ala Asp Gln Gly Ala Lys Val Leu Asn Leu Ser Leu Gly Cys Glu Cys
    215                 220                 225

Asn Ser Thr Thr Leu Lys Ser Ala Val Asp Tyr Ala Trp Asn Lys Gly
230                 235                 240                 245
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Ala Val Val Val Ala Ala Ala Gly Asn Asp Asn Val Ser Arg Thr Phe
                250                 255                 260

Gln Pro Ala Ser Tyr Pro Asn Ala Ile Ala Val Gly Ala Ile Asp Ser
            265                 270                 275

Asn Asp Arg Lys Ala Ser Phe Ser Asn Tyr Gly Thr Trp Val Asp Val
        280                 285                 290

Thr Ala Pro Gly Val Asn Ile Ala Ser Thr Val Pro Asn Asn Gly Tyr
    295                 300                 305

Ser Tyr Met Ser Gly Thr Ser Met Ala Ser Pro His Val Ala Gly Leu
310                 315                 320                 325

Ala Ala Leu Leu Ala Ser Gln Gly Lys Asn Asn Val Gln Ile Arg Gln
                330                 335                 340

Ala Ile Glu Gln Thr Ala Asp Lys Ile Ser Gly Thr Gly Thr Asn Phe
            345                 350                 355

Lys Tyr Gly Lys Ile Asn Ser Asn Lys Ala Val Arg Tyr
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            20                  25                  30

Thr Arg Leu Ser Ala Leu Cys Pro Arg Arg Pro Thr Ala Ser Thr Thr
        35                  40                  45

Thr Phe Ser Glu Ala Ser Arg Asn Leu Asn Ala Asn Asp Leu Lys Thr
    50                  55                  60

Leu Arg Asp His Pro Asp Val Glu Tyr Ile Glu Gln Asp Ala Ile Ile
65                  70                  75                  80

Thr Ile Asn Ala Tyr Thr Gln Gln Pro Gly Ala Pro Trp Gly Leu Gly
                85                  90                  95

Arg Ile Ser His Arg Ser Lys Gly Ser Thr Thr Tyr Glu Tyr Asp Thr
            100                 105                 110

Ser Gly Gly Ser Gly Thr Cys Ala Tyr Val Ile Asp Thr Gly Val Glu
        115                 120                 125
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Ala Ser His Pro Glu Phe Glu Gly Arg Ala Ser Gln Ile Lys Ser Phe
    130                 135                 140

Ile Ser Gly Gln Asn Thr Asp Gly Asn Gly His Gly Thr His Cys Ala
145                 150                 155                 160

Gly Thr Ile Gly Ser Lys Thr Tyr Gly Val Ala Lys Lys Thr Lys Ile
                165                 170                 175

Tyr Gly Val Lys Val Leu Asp Asn Ser Gly Ser Gly Ser Tyr Ser Gly
            180                 185                 190

Ile Ile Ser Gly Met Asp Phe Ala Val Gln Asp Ser Lys Ser Arg Ser
        195                 200                 205

Cys Pro Lys Gly Val Val Ala Asn Met Ser Leu Gly Gly Gly Lys Ala
    210                 215                 220

Gln Ser Val Asn Asp Gly Ala Ala Ala Met Ile Arg Ala Gly Val Phe
225                 230                 235                 240

Leu Ala Val Ala Ala Gly Asn Asp Asn Ala Asn Ala Ala Asn Tyr Ser
                245                 250                 255

Pro Ala Ser Glu Pro Thr Val Cys Thr Val Gly Ala Thr Thr Ser Ser
            260                 265                 270

Asp Ala Arg Ser Ser Phe Ser Asn Tyr Gly Asn Leu Val Asp Ile Phe
        275                 280                 285

Ala Pro Gly Ser Asn Ile Leu Ser Thr Trp Ile Gly Gly Thr Thr Asn
    290                 295                 300

Thr Ile Ser Gly Thr Ser Met Ala Thr Pro His Ile Val Gly Leu Gly
305                 310                 315                 320

Ala Tyr Leu Ala Gly Leu Glu Gly Phe Pro Gly Ala Gln Ala Leu Cys
                325                 330                 335

Lys Arg Ile Gln Thr Leu Ser Thr Lys Asn Val Leu Thr Gly Ile Pro
            340                 345                 350

Ser Gly Thr Val Asn Tyr Leu Ala Phe Asn Gly Asn Pro Ser Gly
        355                 360                 365
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Trp Thr Arg Gly Tyr Thr Gly Thr Gly Val Arg Val Ala Val Leu Asp
            20                  25                  30

Thr Gly Ile Ser Thr His Pro Asp Leu Asn Ile Arg Gly Gly Val Ser
        35                  40                  45
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Phe Val Pro Gly Glu Pro Ser Tyr Gln Asp Gly Asn Gly His Gly Thr
50 55 60

His Val Ala Gly Thr Ile Ala Ala Leu Asn Asn Ser Ile Gly Val Val
65 70 75 80

Gly Val Ala Pro Asn Ala Glu Leu Tyr Ala Val Lys Val Leu Gly Ala
85 90 95

Asn Gly Ser Gly Ser Val Ser Ser Ile Ala Gln Gly Leu Gln Trp Thr
100 105 110

Ala Gln Asn Asn Ile His Val Ala Asn Leu Ser Leu Gly Ser Pro Val
115 120 125

Gly Ser Gln Thr Leu Glu Leu Ala Val Asn Gln Ala Thr Asn Ala Gly
130 135 140

Val Leu Val Val Ala Ala Thr Gly Asn Asn Gly Ser Gly Thr Val Ser
145 150 155 160

Tyr Pro Ala Arg Tyr Ala Asn Ala Leu Ala Val Gly Ala Thr Asp Gln
165 170 175

Asn Asn Asn Arg Ala Ser Phe Ser Gln Tyr Gly Thr Gly Leu Asn Ile
180 185 190

Val Ala Pro Gly Val Gly Ile Gln Ser Thr Tyr Pro Gly Asn Arg Tyr
195 200 205

Ala Ser Leu Ser Gly Thr Ser Met Ala Thr Pro His Val Ala Gly Val
210 215 220

Ala Ala Leu Val Lys Gln Lys Asn Pro Ser Trp Ser Asn Thr Gln Ile
225 230 235 240

Arg Gln His Leu Thr Ser Thr Ala Thr Ser Leu Gly Asn Ser Asn Gln
245 250 255

Phe Gly Ser Gly Leu Val Asn Ala Glu Ala Ala Thr Arg
260 265

7. The animal feed additive of claim 6, wherein the amount of the protease corresponds to an intended addition of 0.01-200 mg protease protein per kg feed.

8. The animal feed additive of any one of claims 6-7, which further comprises phytase, xylanase, galactanase, and/or beta-glucanase.

9. An animal feed composition having a crude protein content of 50-800 g/kg and comprising at least one acid-stable protease, wherein the protease

(i) is of the subtilisin family; and/or

(ii) has less than 10% residual activity when inhibited with SSI.

10. The animal feed composition of claim 9, wherein the amount of the protease is 0.01-200 mg protease protein per kg feed.

11. A method for the treatment of vegetable proteins, comprising the step of adding at least one acid-stable protease to at least one vegetable protein or protein source, wherein the protease

(i) is of the subtilisin family; and/or

(ii) has less than 10% residual activity when inhibited with SSI.

12. The method of claim 11, wherein soybean is included amongst the at least one vegetable protein source.